

Unlike typical flagellated sperm, decapod sperm are comprised of an uncondensed nucleus and a variable number of stationary spikes which radiate from the sperm body. Although other authors have stated that a common structural plan exists for decapod sperm, our recent findings indicate that this is not the case. We have made histochemical and ultrastructural comparisons of sperm from a shrimp, Sicyonia brevirostris, and a lobster, Panulirus argus. Both sperm are similar in that each is approximately spherical, immotile, and has a structurally complex acrosome (periodic acid Schiff positive region). Major differences in structure were observed for the nucleus and spikes. The uncondensed nucleus (Feulgen positive region) in P. argus sperm is surrounded by a nuclear envelope while in S. brevirostris nuclear material is continuous with a peripheral band of cytoplasm. A similar band of cytoplasm is not present in P. argus. The most important distinguishing characteristic between P. argus and S. brevirostris sperm are the spikes. S. brevirostris sperm possess only one spike which always originates from the acrosomal region. The spike is packed with filaments resembling the actin filaments of the penaeid sperm spike. In contrast, P. argus sperm have 3-12 spikes which are lined internally by the nuclear envelope and packed with microtubules, rather than filaments. Results show important differences in the structural plan of shrimp and lobster sperm. In particular, the spikes of the two groups are not homologous and are probably not analogous. Based on these observations and previous findings by ourselves and others, it is concluded that there are at least two basic plans for decapod sperm structure, that characteristic of the natantians (prawns and shrimps) and that characteristic of the reptantians (crayfish, lobsters, and crabs).